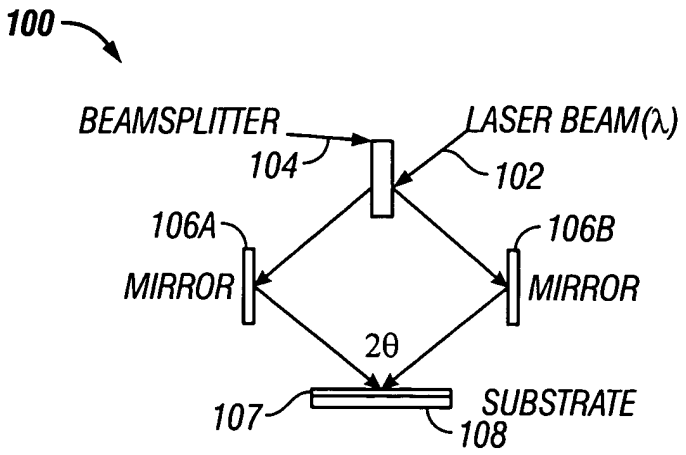

FIG. 1A

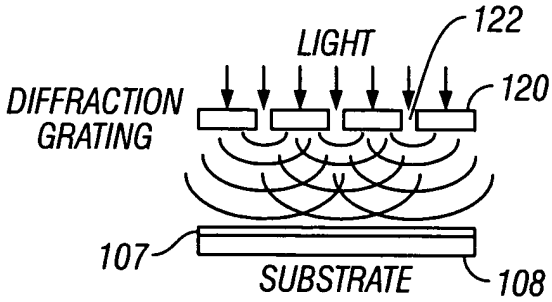

FIG. 1B

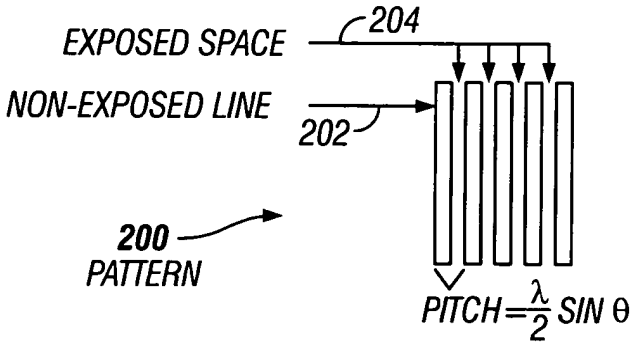

FIG. 2

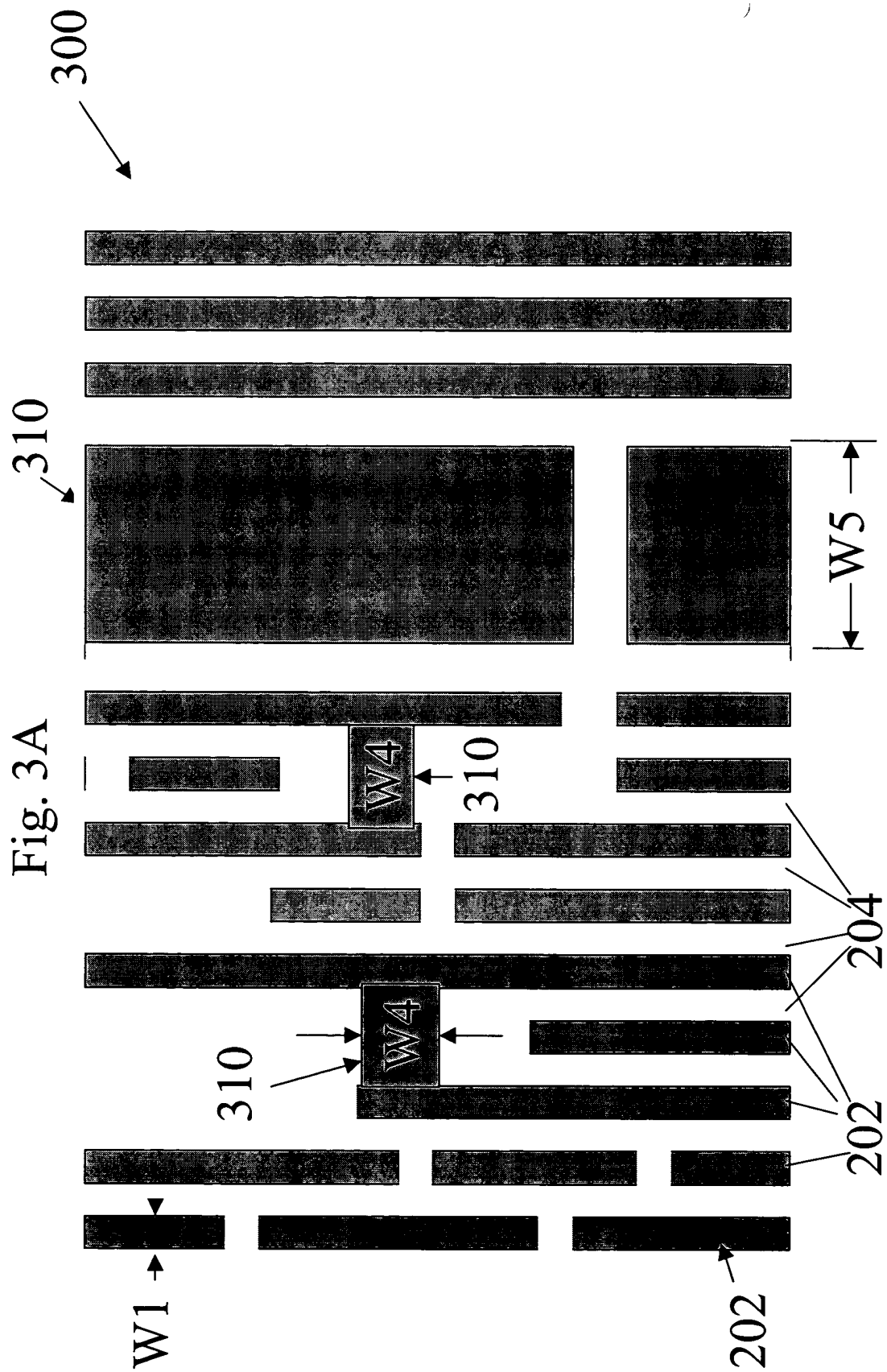

Fig. 3A

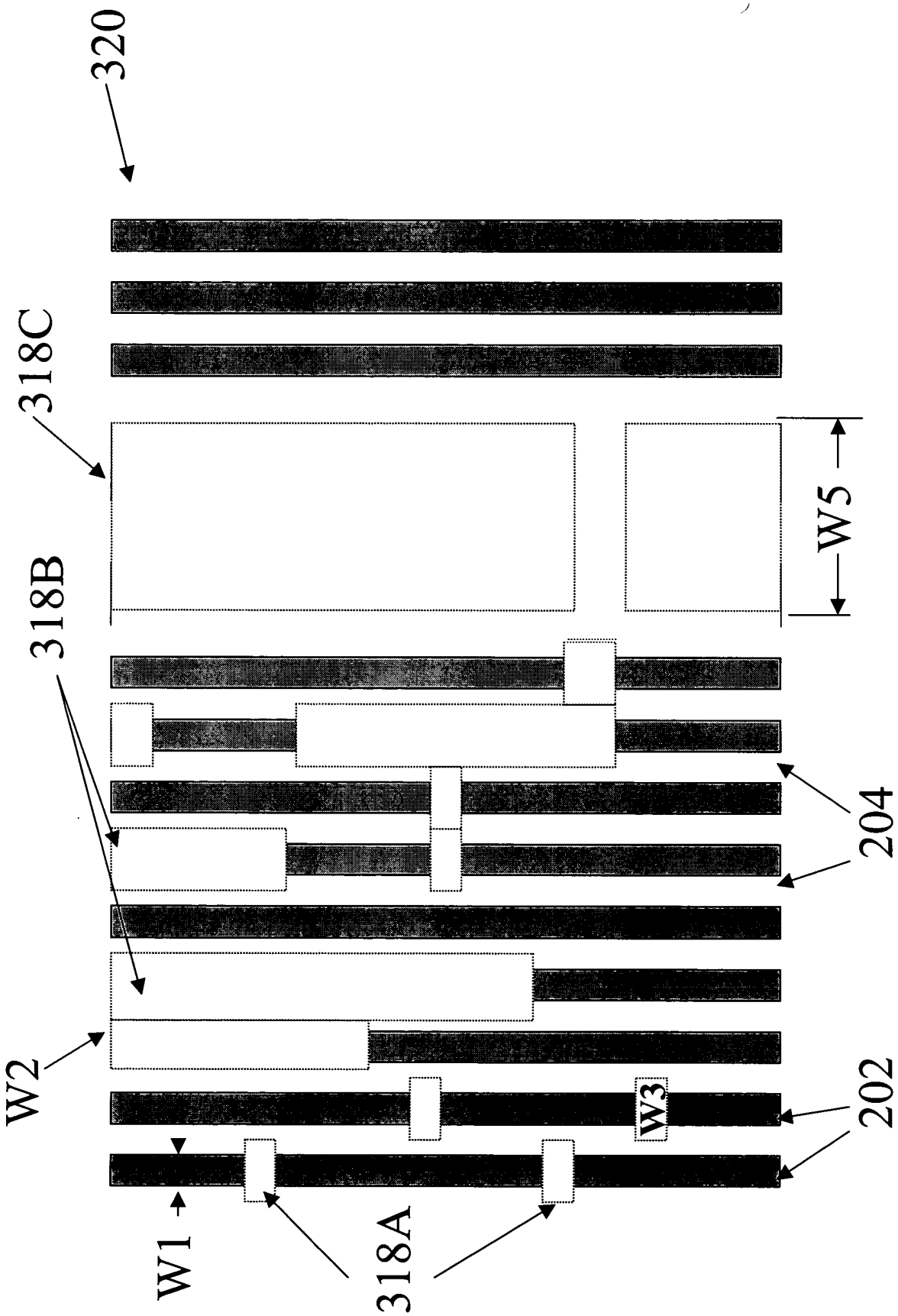

Fig. 3B

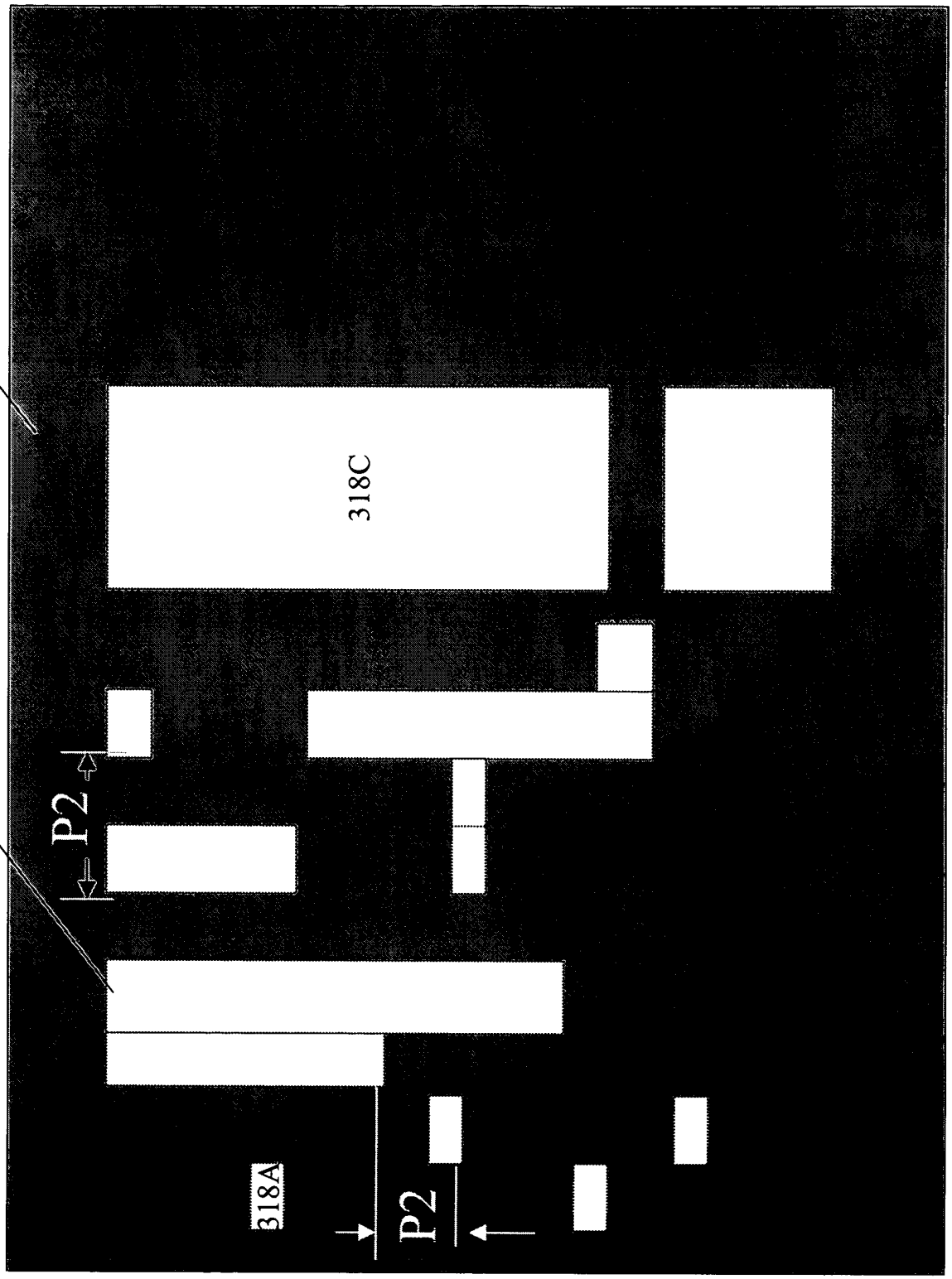

Fig. 3C

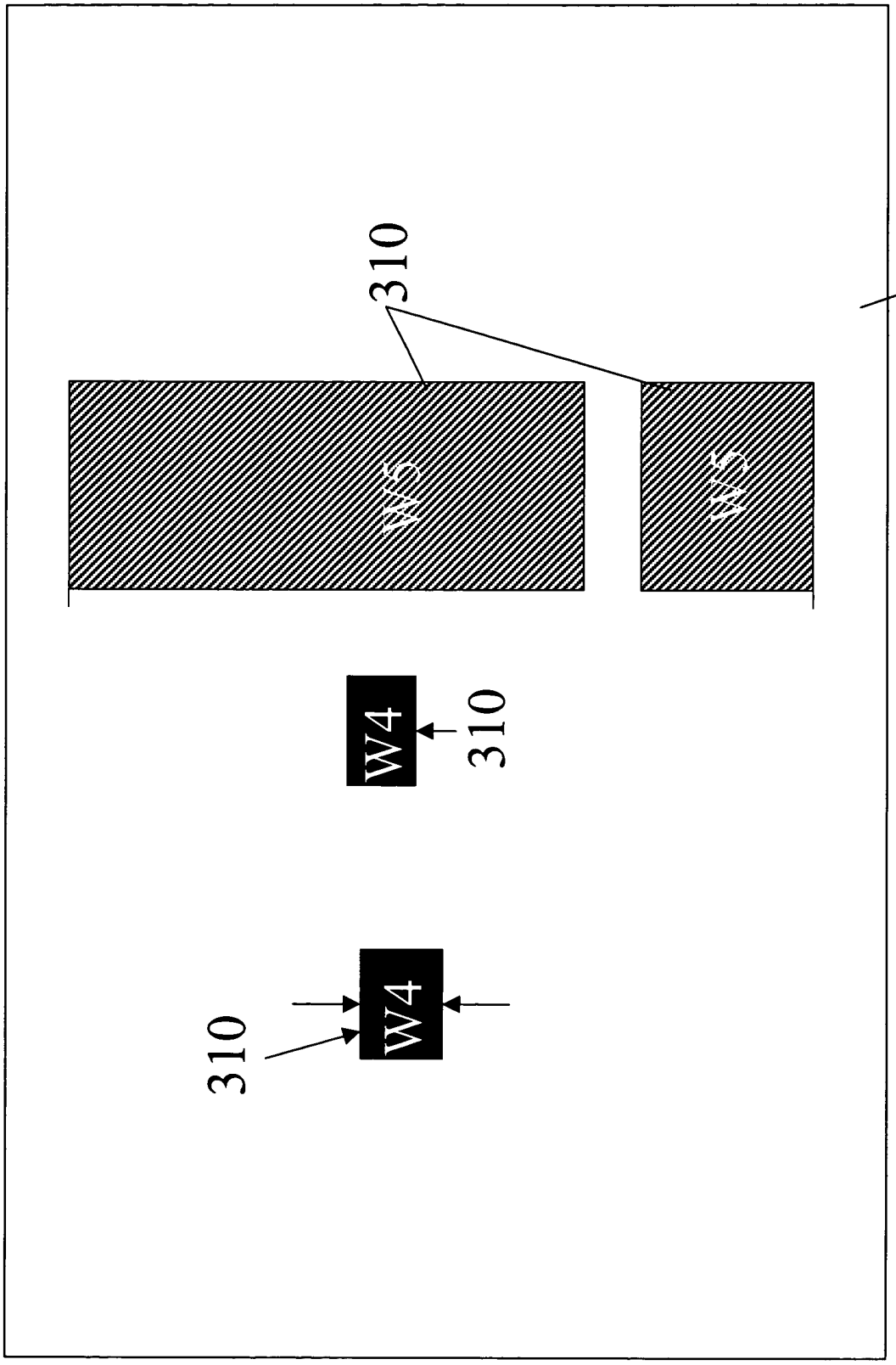

Fig. 3D

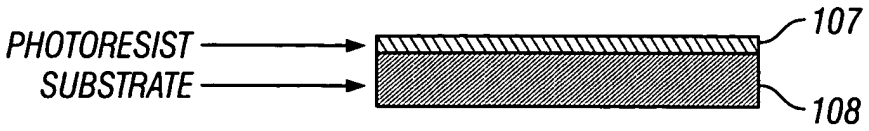

FIG. 4A

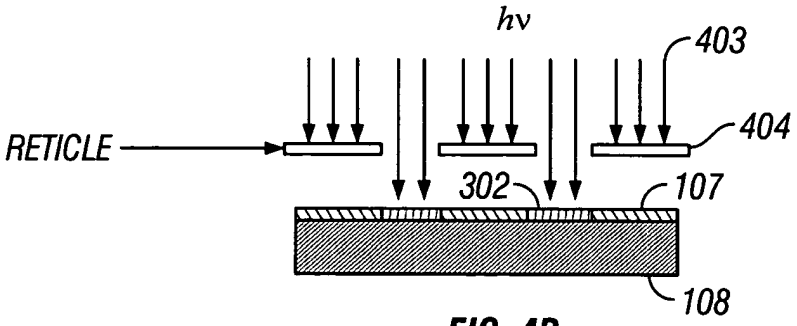

FIG. 4B

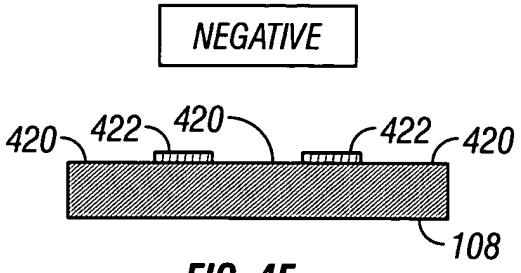

FIG. 4F

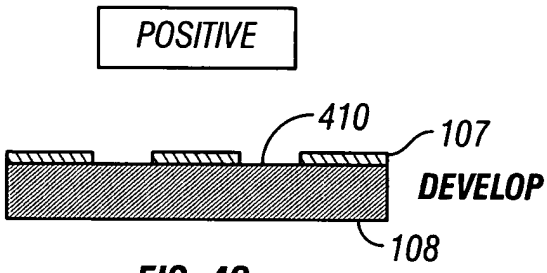

FIG. 4C

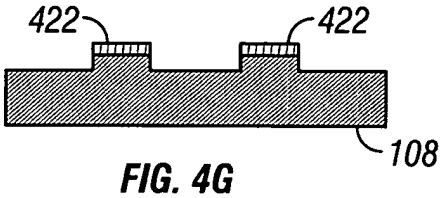

FIG. 4G

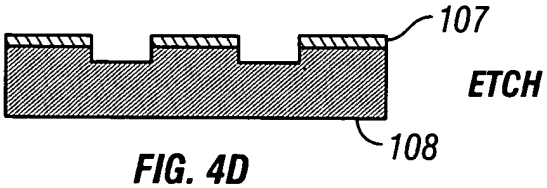

FIG. 4D

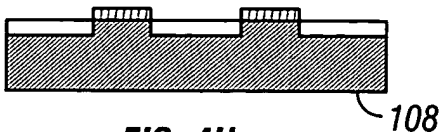

FIG. 4H

FIG. 4E

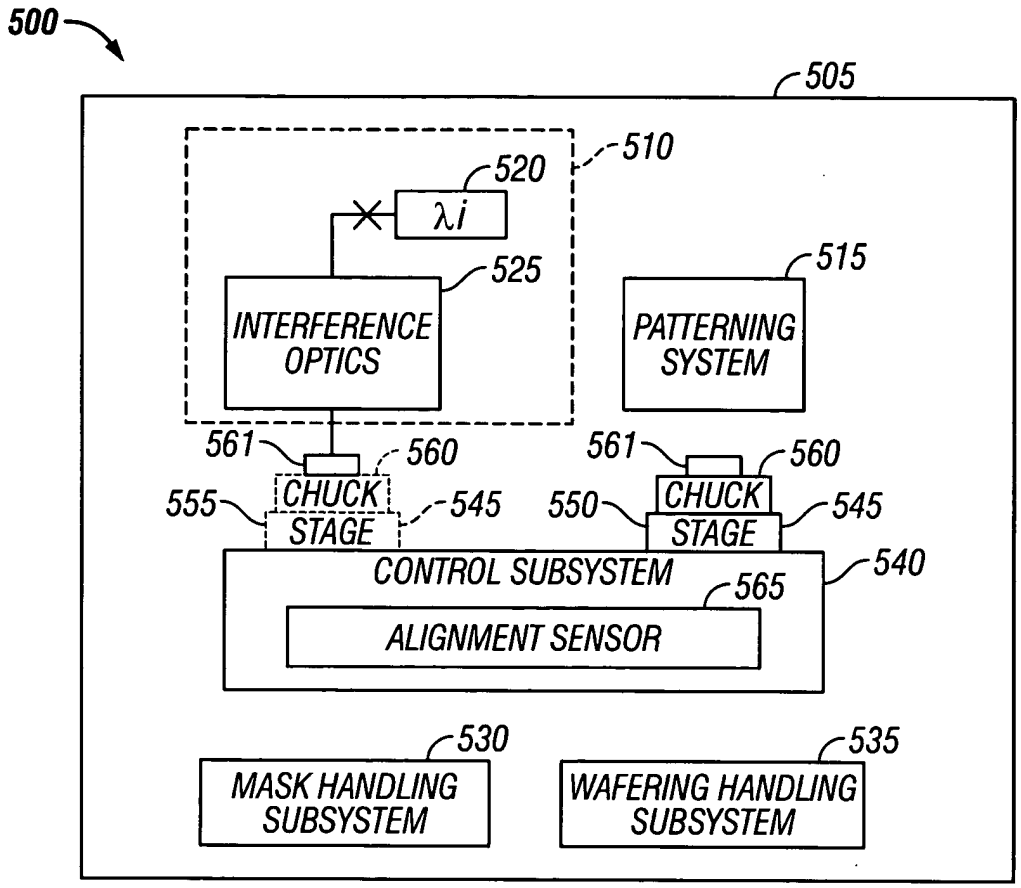
500
505
510
520
λi
525
INTERFERENCE OPTICS
515
PATTERNING SYSTEM
561
560
CHUCK
555
STAGE
545
561
560
CHUCK
550
STAGE
545
CONTROL SUBSYSTEM
540
565
ALIGNMENT SENSOR
530
MASK HANDLING SUBSYSTEM
535
WAFERING HANDLING SUBSYSTEM

FIG. 5

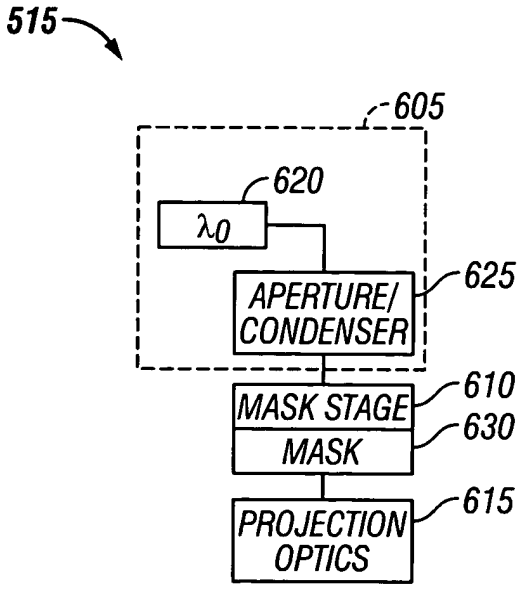
515
605
620
λ0
APERTURE/ CONDENSER
625
MASK STAGE
610
MASK
630
PROJECTION OPTICS
615

FIG. 6

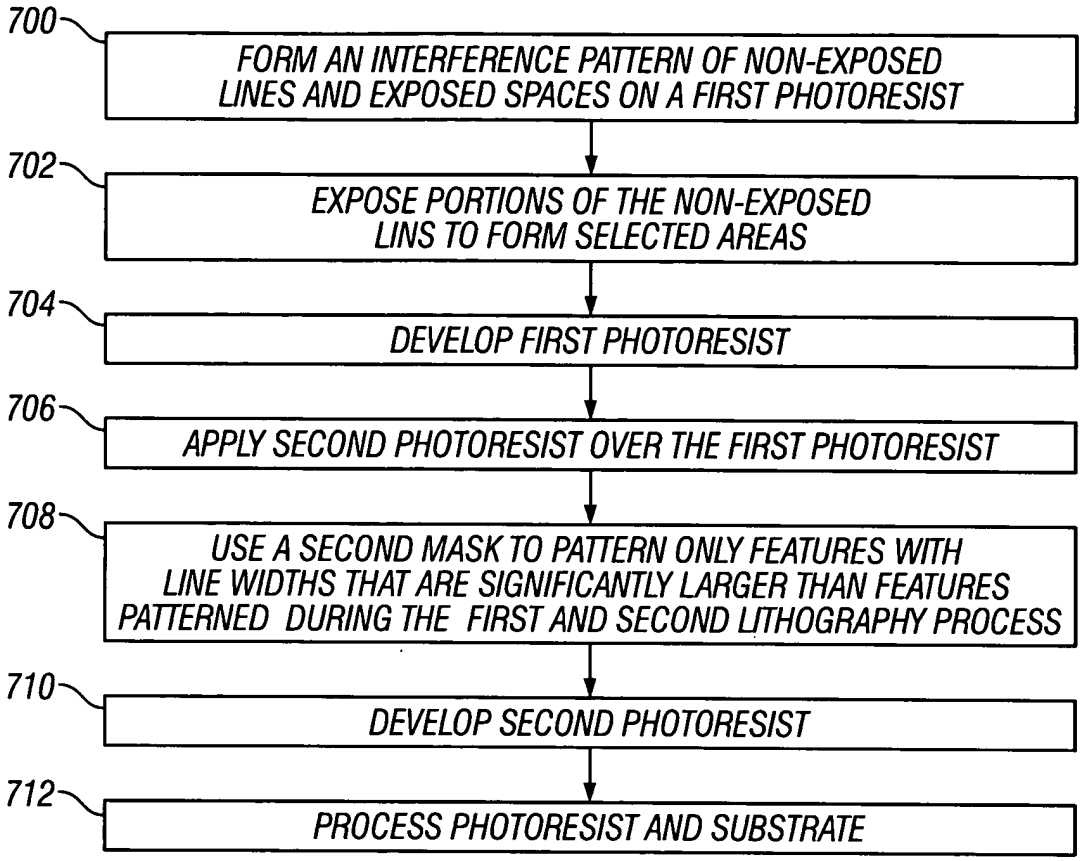
700
FORM AN INTERFERENCE PATTERN OF NON-EXPOSED LINES AND EXPOSED SPACES ON A FIRST PHOTORESIST
702
EXPOSE PORTIONS OF THE NON-EXPOSED LINS TO FORM SELECTED AREAS
704
DEVELOP FIRST PHOTORESIST
706
APPLY SECOND PHOTORESIST OVER THE FIRST PHOTORESIST
708
USE A SECOND MASK TO PATTERN ONLY FEATURES WITH LINE WIDTHS THAT ARE SIGNIFICANTLY LARGER THAN FEATURES PATTERNED DURING THE FIRST AND SECOND LITHOGRAPHY PROCESS
710
DEVELOP SECOND PHOTORESIST
712
PROCESS PHOTORESIST AND SUBSTRATE

FIG. 7

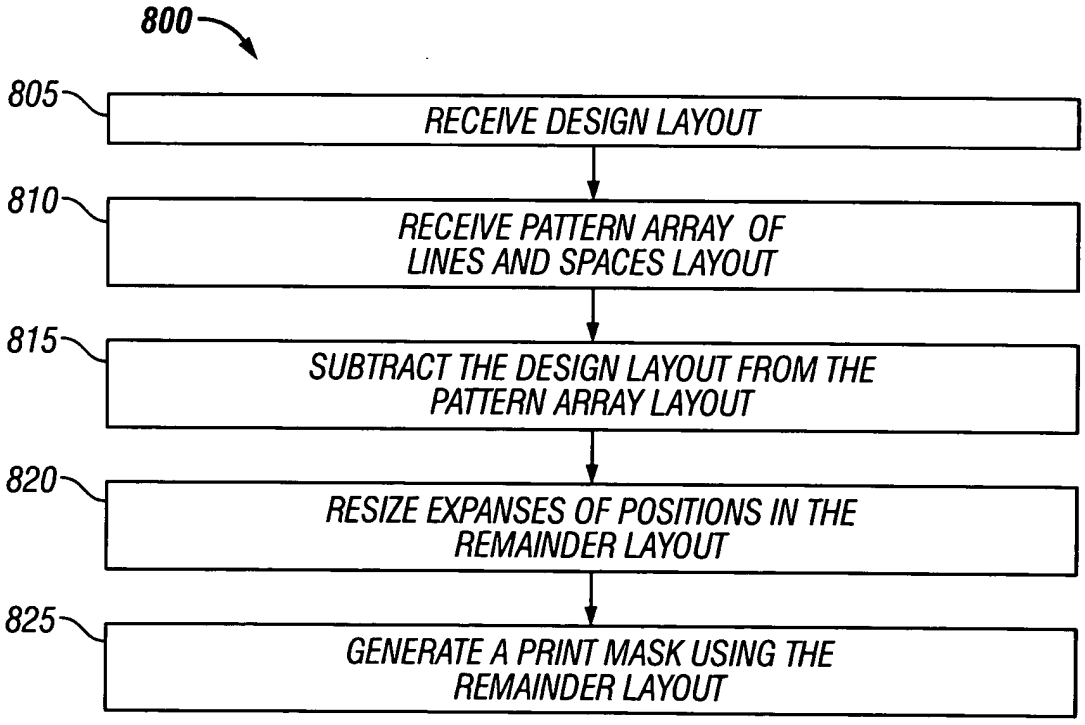
800
805
RECEIVE DESIGN LAYOUT
810
RECEIVE PATTERN ARRAY OF LINES AND SPACES LAYOUT
815
SUBTRACT THE DESIGN LAYOUT FROM THE PATTERN ARRAY LAYOUT
820
RESIZE EXPANSES OF POSITIONS IN THE REMAINDER LAYOUT
825
GENERATE A PRINT MASK USING THE REMAINDER LAYOUT

FIG. 8

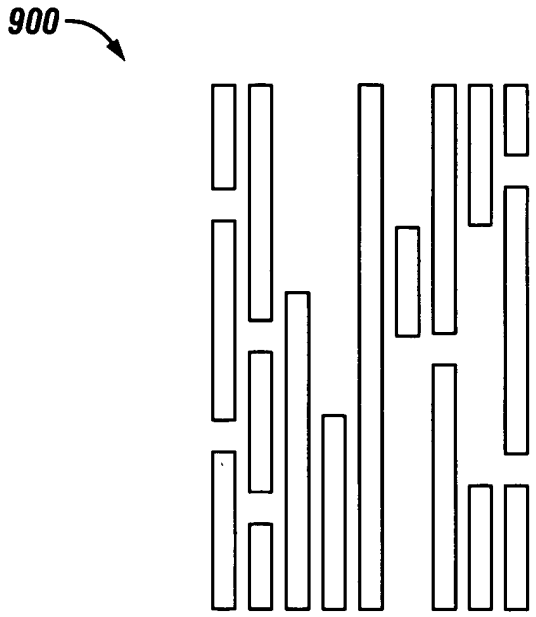

FIG. 9

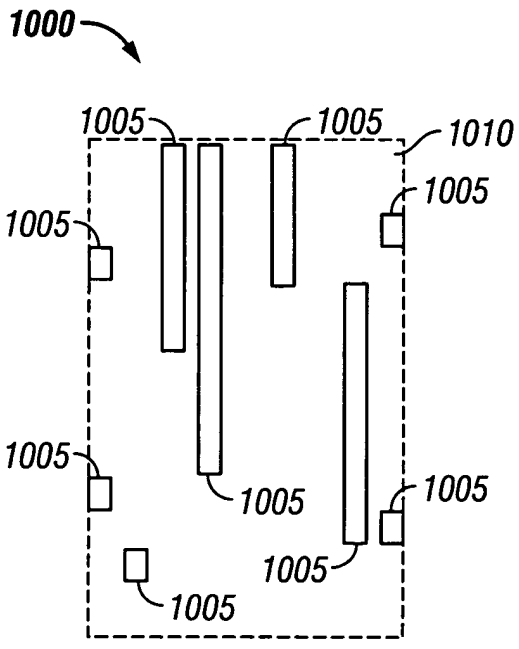

FIG. 10

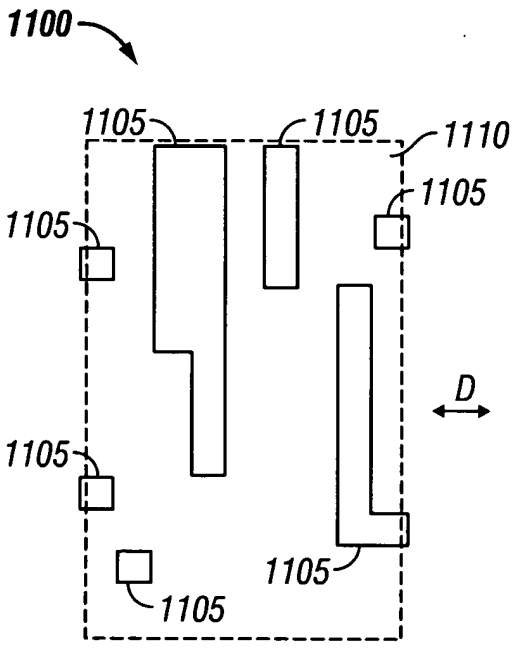

FIG. 11